CLAIMS

1. A method for continuous preparation of a product comprising:
preparing a product using a fully self-cleaning, multi-shaft extruder rotating in a same sense, whose processing area comprises a lateral area Am and a free volume Vf and whose screws, which also have a smooth surface, rotate only with respect to their own axis, wherein screw elements have, on a screw bridge, an outer diameter Da and, on a screw bottom, an internal diameter Di, wherein at least one part of the processing area has at least one of: a ratio Am^3/Vf^2 between 1020 and 3050 for twin screw elements, and a ratio Am^3/Vf^2 between 2000 and 7300 for triple screw elements, at a Da/Di ratio of 1.3 to 1.7.

2. The method in accordance with Claim 1, comprising:
applying a torque density (torque per screw/axis distance^3) of at least 7 Nm/cm^3 to the extruder.

3. The method in accordance with Claim 1, comprising:
applying a torque density (torque per screw/axis distance^3) of at least 9 Nm/cm^3 to the extruder.

4. The method in accordance with Claim 1, wherein the Da/Di ratio is 1.5 to 1.63.

5. The method in accordance with Claim 1, wherein the ratio for twin screw elements is $1500 < Am^3/Vf^2 < 2020$ and the ratio for triple screw elements is $3000 < Am^3/Vf^2 < 5090$.

6. The method in accordance with Claim 1, wherein the product to be processed is a contaminated and/or humid polycondensate.

7. The method in accordance with Claim 6, wherein the polycondensate to be processed is polyester.

8. The method in accordance with Claim 7, wherein the polycondensate to be processed is a polyester PET bottle recyclate.

9. A method for continuous preparation of a product comprising:

preparing a fully self-cleaning, multi-shaft extruder rotating in the same sense, whose processing area comprises a wedge surface Az and a free volume Vf and whose screws, which also have a smooth surface, rotate only with respect to their own axis, wherein screw elements have, on a screw bridge, an outer diameter Da and, on a screw bottom, an internal diameter Di, wherein at least one part of the processing area has at least one of: a ratio Az^3/Vf^2 between 0.5 and 2.11 for twin screw elements, and a ratio Az^3/Vf^2 between 0.02 and 1.50 for triple screw elements, at a Da/Di ratio of 1.3 to 1.7.

10. The method in accordance with Claim 9, comprising:

applying a torque density (torque per screw/axis distance^3) of at least 7 Nm/cm^3 to the extruder.

11. The method in accordance with Claim 9, comprising:

applying a torque density of more than 9 Nm/cm^3 to the extruder.

12. The method in accordance with Claim 9, wherein the Da/Di ratio is 1.5 to 1.63.

13. The method in accordance with Claim 9, wherein the at least one part of the processing area has an Am^3/Vf^2 ratio between 1020 and 3050 for twin screw elements and an Am^3/Vf^2 ratio between 2000 and 7300 for triple screw elements, and an educt component supplied is an elastomer.

14. The method in accordance with Claim 9, wherein the Am^3/Vf^2 ratio is between 1500 and 2300 for twin screw elements, and the Am^3/Vf^2 ratio is between 3000 and 5090 for triple screw elements.

15. The method in accordance with Claim 13, wherein the elastomer is a powdery or granulated elastomer in which at least one filling agent has already been incorporated.

16. The method in accordance with Claim 1, wherein the screw elements are provided with dense combs.

17. The method in accordance with Claim 1, wherein the extruder has at least four individually driven screws.

18. The method in accordance with Claim 1, wherein the extruder has a temperature-controllable core and a temperature-controllable housing which are both stationary.

19. The method in accordance with Claim 18, wherein the temperature of the core and of the housing are controlled separately.

20. The method in accordance with Claim 18, wherein the housing is divided into segments whose temperature is controlled separately.

21. The method in accordance with Claim 1, wherein the screws are disposed in a coronary annular configuration.

22. The method in accordance with Claim 6, wherein during processing, the polycondensate is applied in a molten state and later hardened, wherein a total period during which a temperature of the polycondensate is above a melting temperature of the polycondensate during processing is less than approx. 60 seconds.

23. The method in accordance with Claim 22, wherein the total period during which the temperature of the polycondensate is above the melting temperature of the polycondensate during processing is less than roughly 30 seconds.

24. The method in accordance with Claim 22, wherein a content of residual water in the melt exceeds 200 ppm.

25. The method in accordance with Claim 22, wherein, in its initial form, the polycondensate is a bulk material with a bulk density in a range from 200 kg/m^3 to 600 kg/m^3.

26. The method in accordance with Claim 22, wherein the polycondensate is present as chips or chippings.

27. The method in accordance with Claim 22, wherein the polycondensate material is initially, partially pre-dried prior to application in a molten state.

28. The method in accordance with Claim 22, comprising:
a degassing step during which volatile contaminations and/or decomposition products are removed from a polycondensate melt.

29. The method in accordance with Claim 22, wherein the polycondensate is placed in the extruder in a solid state, the polycondensate is heated to a temperature below a melting point, and the polycondensate is degassed and/or dried at a pressure below atmospheric pressure and/or while adding an inert gas.

30. The method in accordance with Claim 29, wherein a total time during which the polycondensate is in the molten state during the process comprises a first period during which the polycondensate remains in the extruder after application in the molten state and a second period during which the polycondensate, which is still in the molten state, is processed outside of the extruder.

31. The method in accordance with Claim 30, wherein a duration of the first period is less than approx. 15 seconds.

32. The method in accordance with Claim 30, wherein a duration of the first period is less than approx. 10 seconds.

33. The method in accordance with Claim 29, wherein processing of the molten polycondensate outside of the extruder includes filtering of the melt.

34. The method in accordance with Claim 29, wherein the processing of the molten polycondensate outside of the extruder includes using a melt pump.

35. The method in accordance with Claim 22, wherein upon hardening, the polycondensate is processed to form a granulate made up of pellets.

36. The method in accordance with Claim 9, wherein the screw elements are provided with dense combs.

37. The method in accordance with Claim 9, wherein the extruder has at least four individually driven screws.

38. The method in accordance with Claim 9, wherein the extruder has a temperature-controllable core and a temperature-controllable housing which are both stationary.

39. The method in accordance with Claim 9, wherein the screws are disposed in a coronary annular configuration.